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Ltd., 1048, Oaza-Kadoma, Kadoma-shi, Osaka 571-8686 (JP). **KURIHARA, Fumikazu** [JP/JP]; c/o Matsushita Electric Works, Ltd., 1048, Oaza-Kadoma, Kadoma-shi, Osaka 571-8686 (JP).

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(74) Agents: **NISHIKAWA, Yoshikiyo** et al.; Hokuto Patent Attorneys Office, Umeda-Daiichiseimei Bldg. 5F, 12-17, Umeda 1-chome, Kita-ku, Osaka-shi, Osaka 530-0001 (JP).

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(71) Applicant (*for all designated States except US*): **MATSUSHITA ELECTRIC WORKS, LTD.** [JP/JP]; 1048, Oaza-Kadoma, Kadoma-shi, Osaka 571-8686 (JP).

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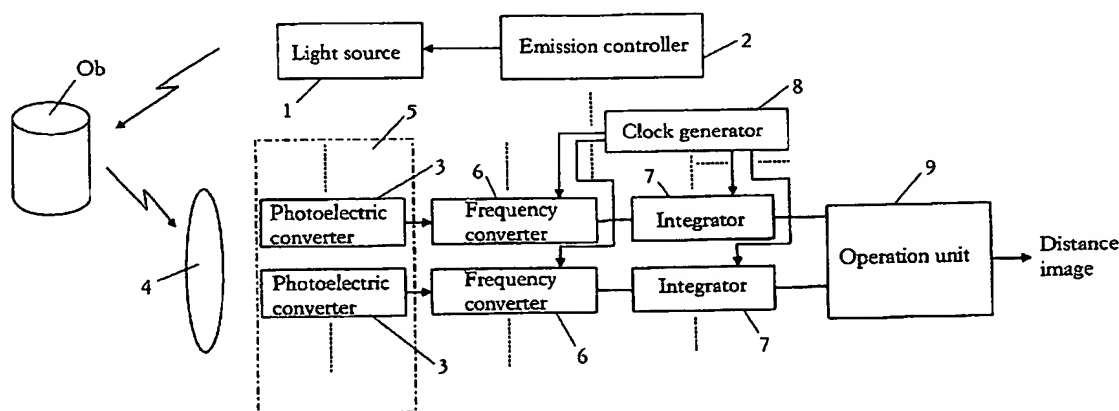
(72) Inventors; and

(75) Inventors/Applicants (*for US only*): **HASHIMOTO, Yusuke** [JP/JP]; c/o Matsushita Electric Works, Ltd., 1048, Oaza-Kadoma, Kadoma-shi, Osaka 571-8686 (JP). **TAKADA, Yuji** [JP/JP]; c/o Matsushita Electric Works,

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(54) Title: THREE DIMENSIONAL IMAGE SENSING DEVICE USING INTENSITY MODULATED LIGHT



(57) Abstract: A spatial information detecting device using an intensity-modulated light is provided. This device comprises a photoelectric converter for receiving a light from a space into which a light intensity-modulated at a predetermined emission frequency is being irradiated, and generating an electrical output corresponding to an intensity of received light; a local oscillator circuit for outputting a local oscillator signal having a local oscillator frequency different from the emission frequency; a sensitivity controller for mixing the local oscillator signal with the electrical output to frequency convert the electrical output into a beat signal having a lower frequency than the emission frequency; an integrator for performing integration of said beat signal at a predetermined timing; and an analyzer for detecting information concerning the space according to an output of the integrator. According to this device, it is possible to accurately detect the spatial information without using a switching element having high-speed response at the light receiving side.

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A. CLASSIFICATION OF SUBJECT MATTER IPC 7 G01S17/32 G01S17/89 G01J9/00		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) IPC 7 G01S G01J		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
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C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 197 04 496 A (SCHWARTE RUDOLF PROF DR ING) 12 March 1998 (1998-03-12) abstract; claim 2; figures 2,7,8,11 page 2, line 62 -page 3, line 44 page 4, line 12-30 page 4, line 65 -page 5, line 4 page 6, line 8-15 page 7, line 54-57 page 9, line 1-14	1-13, 16-19
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A	US 5 856 667 A (SEITZ PETER ET AL) 5 January 1999 (1999-01-05) the whole document	1-6, 10, 11, 13, 19
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<input checked="" type="checkbox"/> Further documents are listed in the continuation of box C. <input checked="" type="checkbox"/> Patent family members are listed in annex.		
* Special categories of cited documents : "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "Z" document member of the same patent family		
Date of the actual completion of the international search 2 October 2003		Date of mailing of the international search report 15/10/2003
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax (+31-70) 340-3016		Authorized officer Gröbl, A

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	<p>US 5 754 280 A (MATSUZAKI HIROSHI ET AL)</p> <p>19 May 1998 (1998-05-19)</p> <p>abstract; figure 4</p> <p>column 2, line 54 -column 4, line 11</p> <p>column 10, line 10-27</p>	1
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